

while this same wind causes a drop in water level at the northern end of Pamlico Sound, on the sound side of Oregon Inlet. This wind induced tilt in water level enhances inflow on the tidal flood and decreases outflow on the ebb. Hence southward winds enhance recruitment of fish larvae into the sound system through Oregon Inlet. However, on these same southward winds, the wind induced flow in Croatan Sound is to the south bringing Albemarle Sound water to Pamlico Sound and preventing fish larvae and juveniles from entering Albemarle Sound. Hence the nature of the hydrodynamical coupling between Albemarle and Pamlico Sounds works against the recruitment of ocean spawned finfish larvae and juveniles into Albemarle Sound.

Predictive capabilities for the flow of water through Croatan Sound are then created using two different approaches. First, a data based, empirical model which utilizes the measured winds to predict currents is provided. Then three-dimensional time-dependent model results of water level throughout the entire APES system and currents in Croatan Sound are presented. Both the empirical and the numerical model results are in good agreement with observations.